

VICTORY ENERGY™
KEYSTONE®
STEAM GENERATING
SYSTEMS

EXHIBIT

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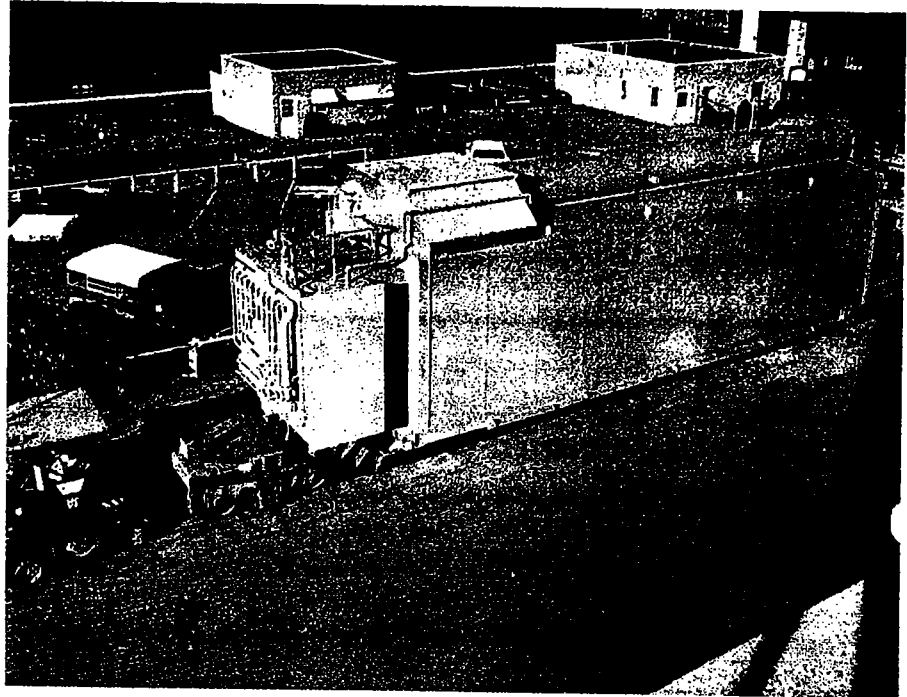
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KEYSTONE[®] HARNESSING STEAM ENERGY

Man has always strived to harness air, water, fire, and products of the earth to save his own energy and to perform useful work. Ever since the first century, when Hero of Alexandria utilized these elements to build a primitive steam reaction turbine, man has devised numerous ways of harnessing steam for energy. Through the centuries, man, in his quest for more capacity, more power, and more efficiency from the same vessel, improved and revised the use of steam for energy. History too, through the demands of the industrial revolution, forced man to abandon manual labor, the horse and the sail for better energy alternatives.

A company named *Zum Industries, Inc.*, saw its future in steam power. Throughout the years the Company was to meet demand after demand for its ever-expanding line of energy systems. In fact, the Company was to pioneer many developments in designing and constructing ways to harness steam energy. As demands grew, so did the steam capacity – and the steam generator moved from the factory to the field-erected version where space was not so limiting. But field construction costs and capital expenditures grew, too, and along with them the demand for higher capacity “package” steam generators. The Company responded with the development of the KEYSTONE Steam Generating System, a factory-assembled or modular field-erected energy “package” capable of producing 6,000 to 500,000 pounds-of-steam per-hour and more. The KEYSTONE is symmetrical in design, easy to ship, install, operate, and maintain and is available in design pressures up to 2000 PSIG and total steam temperatures to 1050° Fahrenheit. Custom-designed fuel burning systems provide the best method for firing gas and/or oil or for special applications such as utilizing carbon monoxide gases and a wide variety of other waste gases. Energy recovery and pollution control equipment complement the KEYSTONE for industrial, power, utility, and processing applications. *Victory Energy* has acquired the license to manufacture KEYSTONE Steam Generating Systems.



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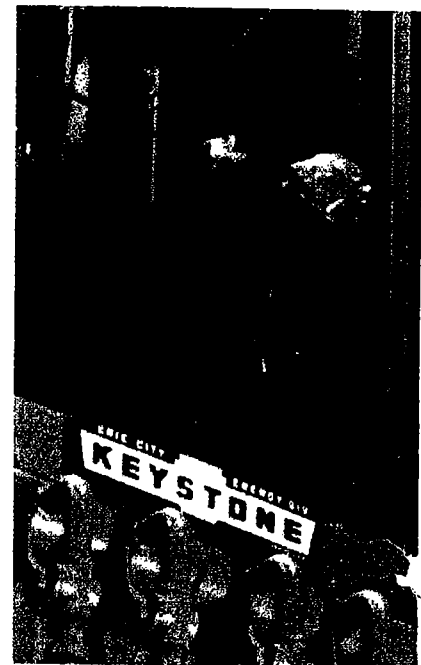
The KEYSTONE Steam Generator, a large capacity “package” unit, was developed to fill a critical void between large field-erected steam generators – which were time-consuming to assemble and costly to construct – and small factory-assembled steam generators which were limited in capacity.

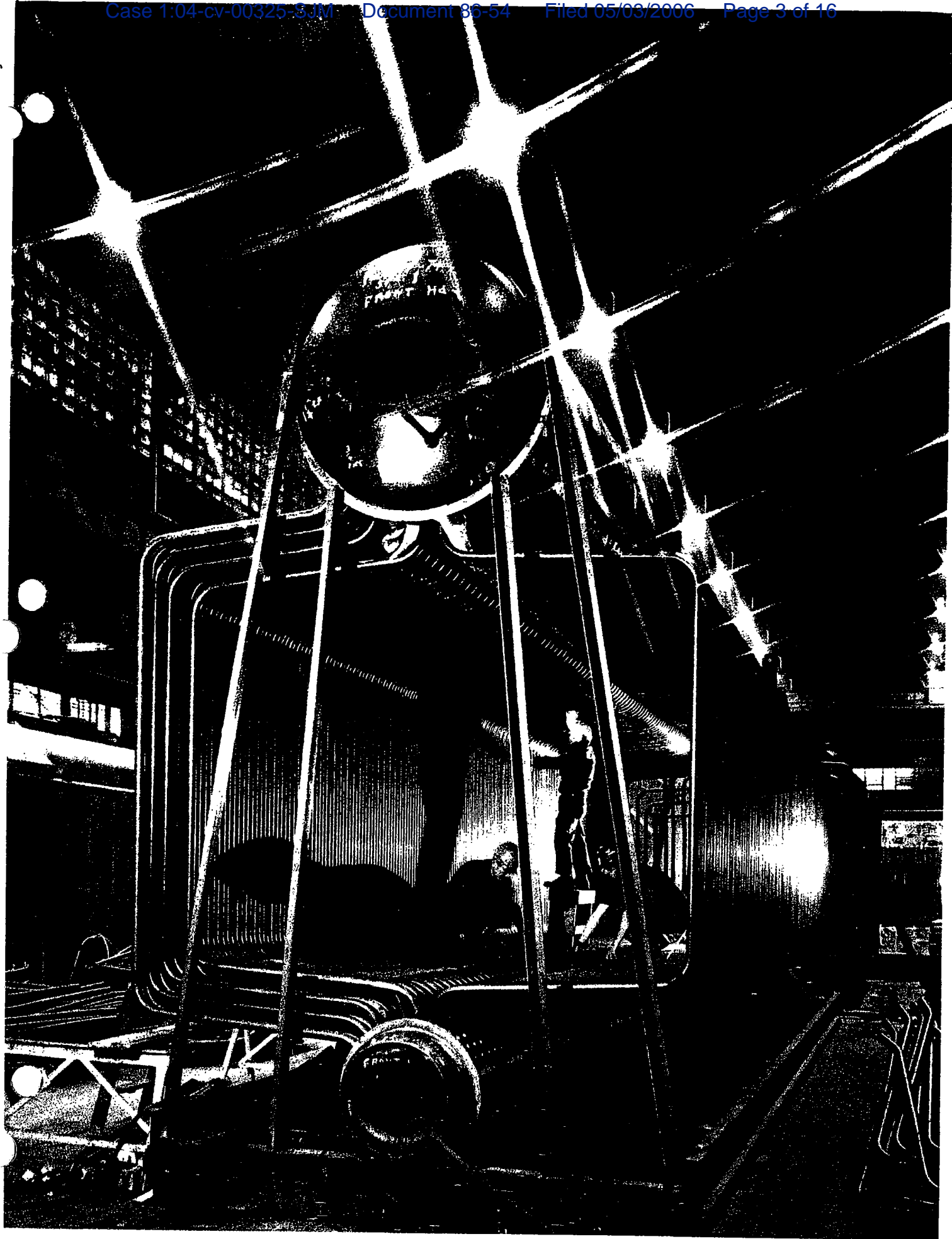
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The KEYSTONE – named after the key block needed to build an arch – ushered in a new generation of “package” energy systems.

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KEYSTONE construction begins with the drums symmetrically supported on a longitudinal centerline. Tube rolling begins with the center furnace tubes and ends with the outer side wall and rear wall tubes. This unique furnace tube configuration provides for faster steam generating capabilities with lower furnace heat absorption rates. Once all tubes are in final position the unit is ready for hydrostatic testing at 1½ times the PSIG design pressure.





KEYSTONE: ENGINEERED AS A PACKAGE

All basic components of the KEYSTONE are the same – only the physical dimensions vary to meet the required operating conditions.

Single-Source Responsibility

Victory Energy designs, manufactures, and services every basic component in the steam generator – burner, superheater, and heat recovery systems to assure complete customer satisfaction.

Minimum Space

The uniquely-designed KEYSTONE is very compact and has minimal space requirements. Foundation area and installation costs are minimized by mounting the stack on the KEYSTONE'S top front gas outlet.

Minimum Maintenance

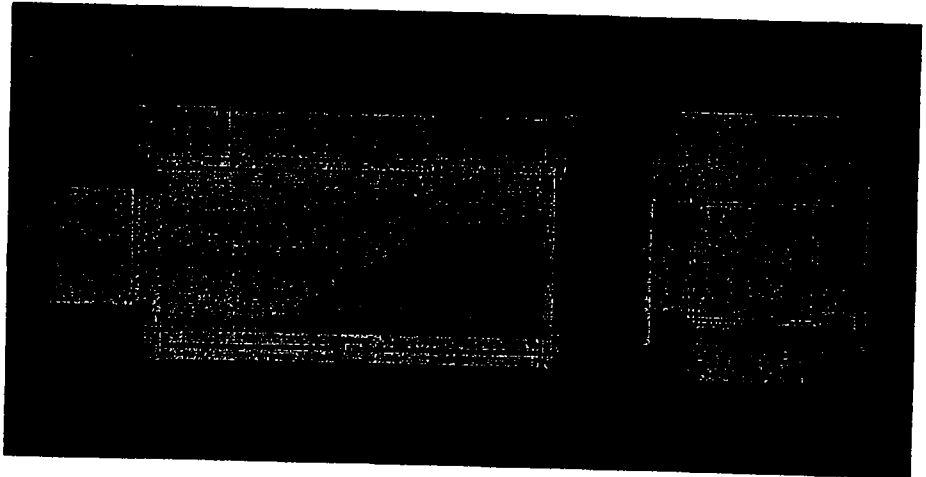
The KEYSTONE has no refractory baffles, headers or handhole plates to maintain. All tubes are 2" O.D. throughout permitting the use of a standard tube cleaner. Rapid water circulation keeps sludge and scale deposits to a minimum. Manholes in both ends of each drum allow easy access to the drum internals.

Pre-Engineered Piping Arrangement

Because each KEYSTONE is furnished as a total package, the piping module is perfectly matched to the steam generator. The steam generator is designed for easy hookup to fuel, water, and electrical connections.

Economical Operation

Pressurized firing insures accurate control of excess air. There is no infiltration of outside air to upset the preset fuel-air ratio and provides better burner performance and thermal efficiency. The engineered system of modulating controls proportions fuel and air as the load requirement changes.



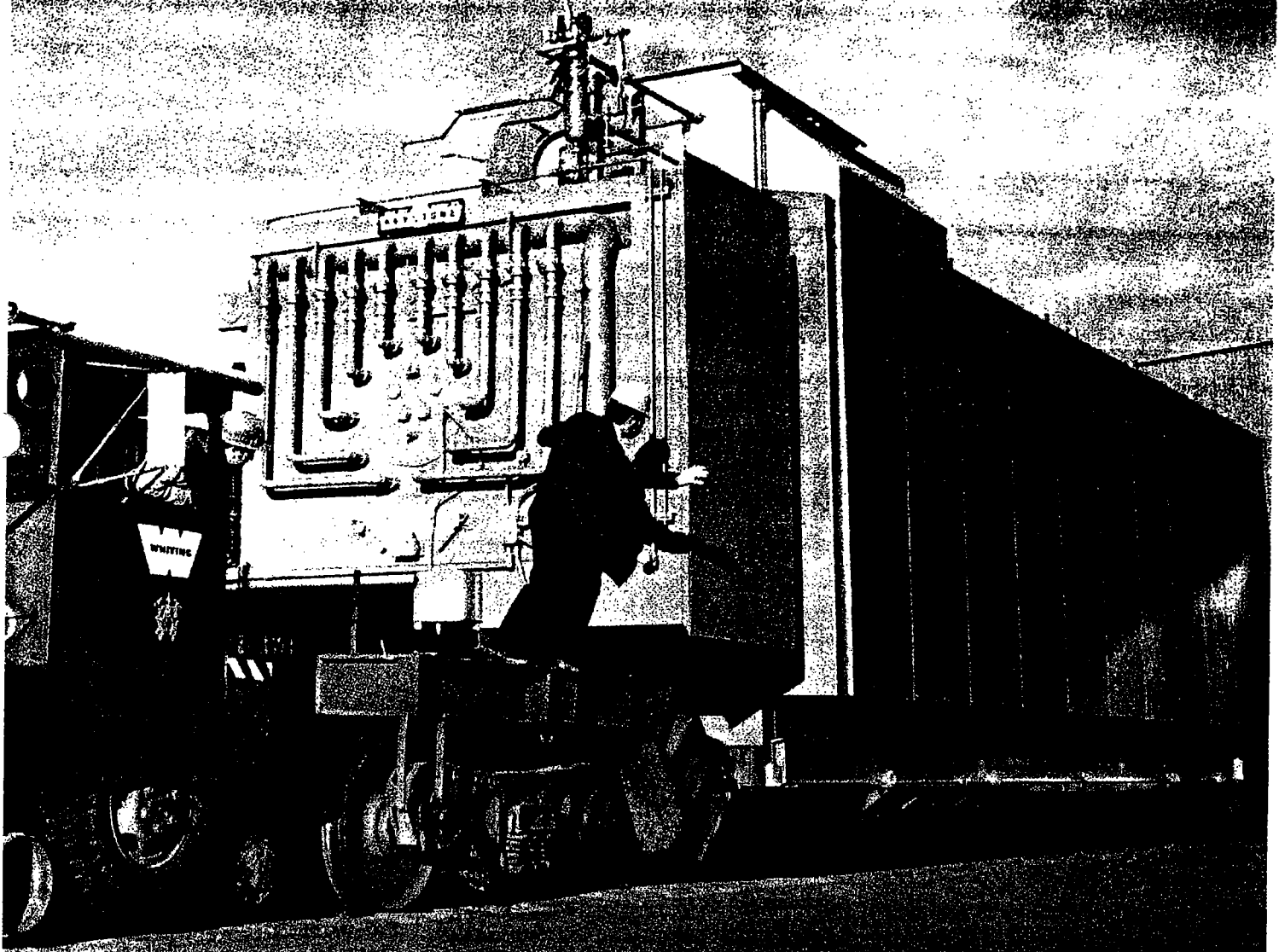
Standard Dimensions*

Size No.	A Overall Length	B Overall Width	C Overall Height	D Base Length
3M	15'-3"	7'-6"	12'-8 1/4"	9'-9"
4M	15'-11"	7'-6"	12'-8 1/4"	10'-5"
5M	17'-3"	7'-6"	12'-8 1/4"	11'-9"
6M	19'-3"	7'-6"	12'-8 1/4"	13'-9"
7M	19'-7"	9'-0"	12'-8 1/4"	13'-1"
8M	20'-7"	9'-0"	12'-8 1/4"	14'-1"
9M	22'-3"	9'-0"	12'-8 1/4"	15'-9"
10M	22'-5"	10'-0"	13'-3 1/4"	16'-1"
11M	24'-7"	10'-0"	13'-3 1/4"	18'-1"
12M	26'-7"	10'-0"	13'-3 1/4"	19'-1"
13M	27'-7"	10'-0"	13'-3 1/4"	20'-1"
14M	25'-0"	11'-6"	14'-0"	20'-5"
15M	26'-8"	11'-6"	14'-0"	22'-1"
16M	28'-8"	12'-0"	14'-6"	24'-1"
17M	29'-8"	12'-0"	14'-6"	25'-1"
18M	30'-8"	12'-0"	14'-6"	26'-1"
19M	32'-8"	12'-0"	14'-6"	28'-1"
20M	35'-8"	12'-0"	14'-6"	31'-1"
21M	37'-8"	12'-0"	14'-6"	33'-1"
22M	39'-0"	12'-2"	15'-6"	34'-5"
23M	42'-0"	12'-2"	15'-6"	37'-5"
24M	46'-2"	12'-11"	16'-0"	38'-5"
25M	49'-0"	12'-11"	16'-0"	41'-3"
26M	52'-0"	12'-11"	16'-0"	44'-3"

*Dimensions Subject to Change Without Notice

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Symmetrical design assures easy handling indoors or out.



KEYSTONE: DESIGNED FOR EFFICIENT ENERGY PRODUCTION

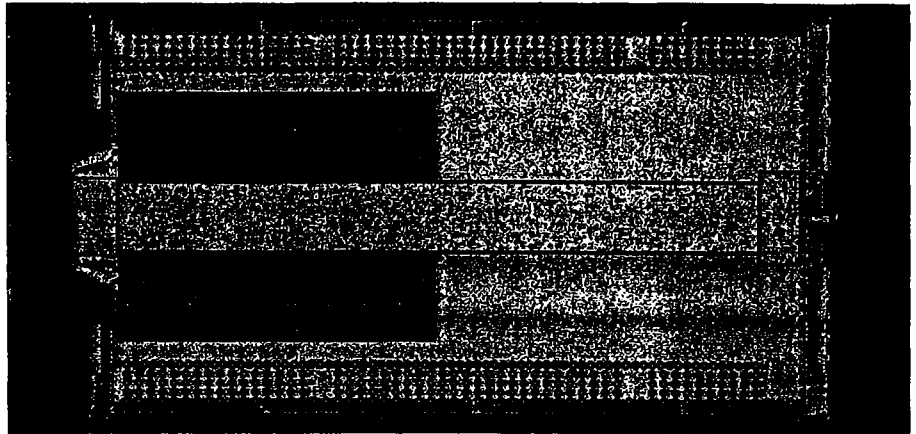
The unique design of the *Victory Energy* KEYSTONE boiler offers uniform gas distribution, equal expansion and vertical flue gas outlet. The symmetrical arrangement and short furnace tubes offer lower heat absorption and higher circulation ratios than other package steam generator designs.

The KEYSTONE Steam Generator furnace is composed of all 2" tangent or membrane tubes forming a water-cooled wall which directs the flow of gases from the front of the unit through the furnace and around both sides at the rear into the convection zones and toward the front of the unit with a top vertical flue gas discharge. (See Heat Flow Pattern at right.)

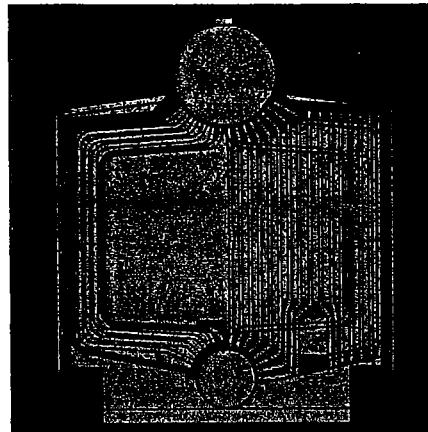
Heat Recovery Options

For maximum overall steam generator efficiency with low initial cost, *Victory Energy* offers combinations of heat recovery equipment. This equipment and auxiliaries can be mounted on top of the steam generator, saving valuable floor space and eliminating the need for excessive foundations. Finned Tube Economizers utilize often-wasted flue gas heat to increase feedwater temperature, thereby increasing efficiency and reducing fuel consumption. Tube and fin spacing within each Economizer are arranged for the particular fuel or fuels being fired.

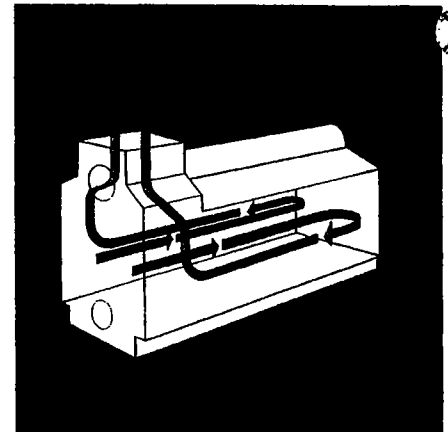
Victory Energy also offers regenerative-type air preheaters as another heat recovery option. In the regenerative air preheat method, heat from flue gas is transferred to incoming cold air by continuously rotating heat transfer elements. This greatly increases the temperature of incoming combustion air which maximizes fuel economy and operating efficiency. Air preheaters can also be mounted on top or off to the side, of the steam generator, according to plant requirements.



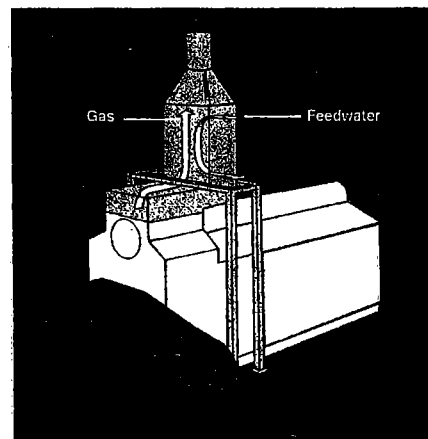
KEYSTONE PLAN VIEW



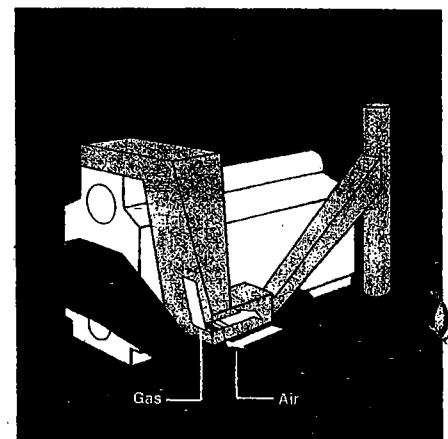
CROSS SECTION VIEW



HEAT FLOW PATTERN



TYPICAL FIN TUBE
ECONOMIZER



TYPICAL REGENERATIVE
AIR PREHEATER

Two-Drum Symmetrical Arrangement

All tubes terminate in the large drums with no intermediate headers. The generous steam-relieving surface of the full-length drum contributes to stable water level and high steam purity.

2 Burners

A full selection of *Victory Energy* fuel burning systems with the ability to burn a large variety of fuels enhances the unit responsibility.

3 Membrane Furnace Tube Walls

The furnace side walls are formed by membrane tubes which provide 100% water-cooled surface resulting in an extremely low heat absorption rate.

4 Convection Tubes

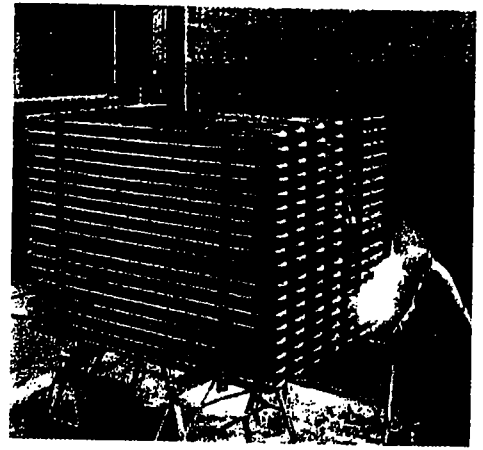
In-line convection zone tubes insure adequate flow area and flue gas contact with the heating surfaces to maximize heat transfer.

5 Water Wall Construction

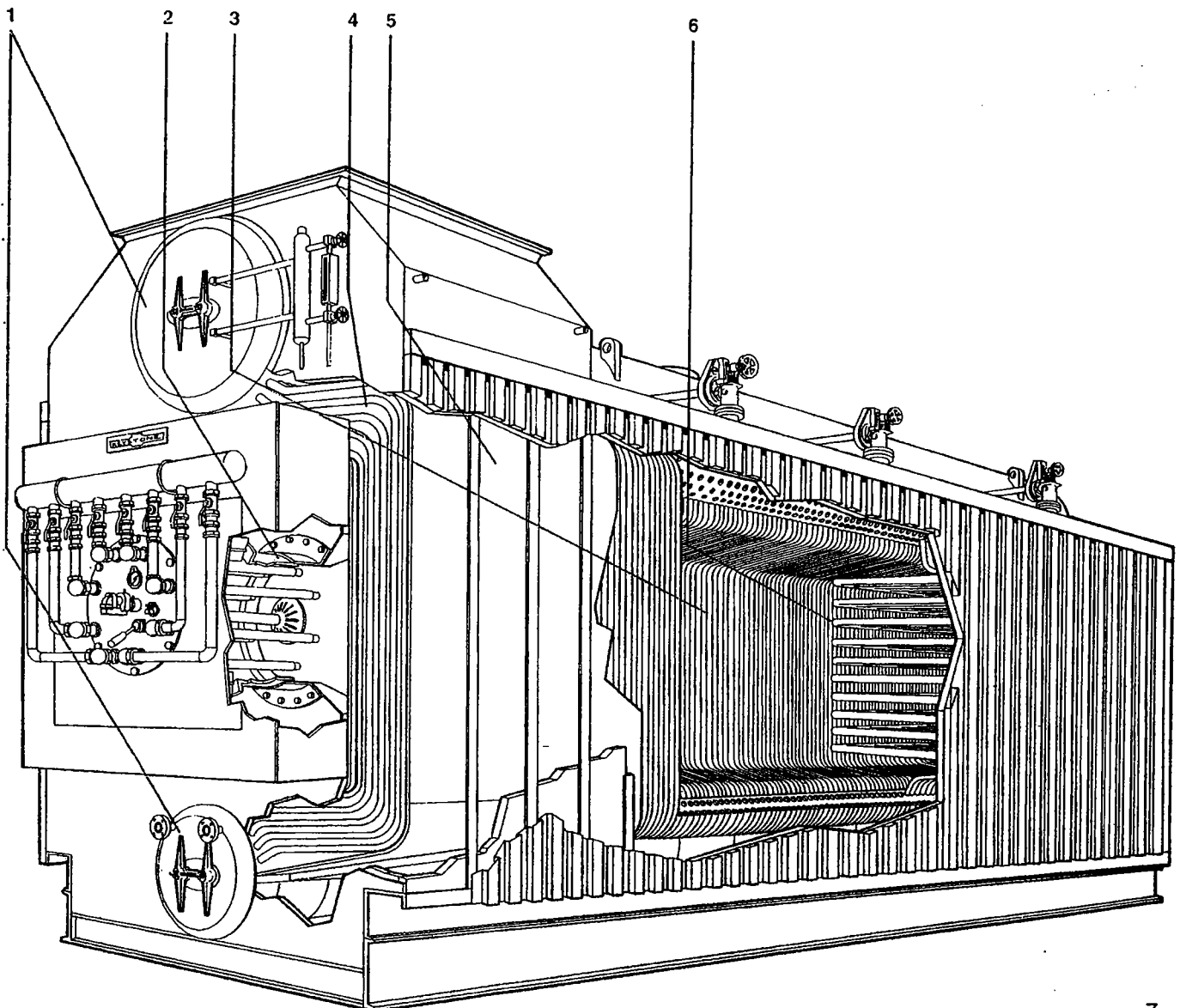
Membrane outside tubes with a reinforced welded inner seal casing provides a gas-tight envelope. Jacketed insulation is applied for minimum heat loss. An outer ribbed or flat lagging adds final exterior protection.

6 Drainable Type Superheater

A separate superheater module is installed in the rear of the furnace. This arrangement is characteristic of a flat, total steam temperature curve throughout the normal operating range of the unit. Superheater headers are located outside of the flue gas area.



The superheater is completely assembled, welded, and stress relieved prior to installation through the KEYSTONE rear wall area. Alloy tubing and one (1) ppm steam purity insure exacting performance and long operating life to this very critical component of the steam generator.



KEYSTONE. WALL CONSTRUCTION

Victory Energy's design, engineering and manufacturing advances offer a complete range of wall construction technology.

FURNACE WALLS

Side Walls

- ☐ Membrane or Tangent tube construction (Figures A & C) is standard on all KEYSTONES.

Rear Wall

- ☐ Water-cooled Tube and Tile (Figure B) is standard on smaller capacity units.
- ☐ Water-cooled and Welded (Figure C) construction for additional heating surface and minimum refractory maintenance on high capacity units.

Front Wall

- ☐ Refractory construction is standard on smaller capacity units.
- ☐ Water-cooled and Welded Walls (Figure C) are a cost-saving option available for high-capacity units. Figure D shows how the burner throat is an integral part of the water-cooled front wall.

CONVECTION SIDE WALLS

- ☐ Membrane or Tangent Tube Construction (Figures A & C) is standard on all KEYSTONES.

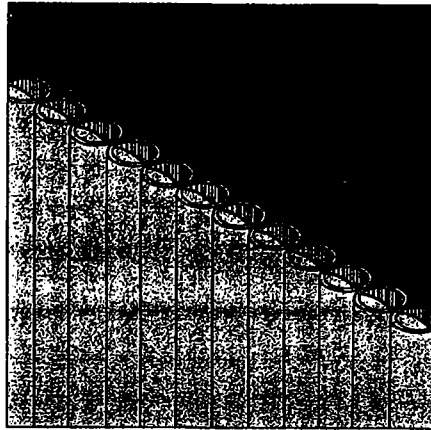


FIG. A) TANGENT TUBE CONSTRUCTION

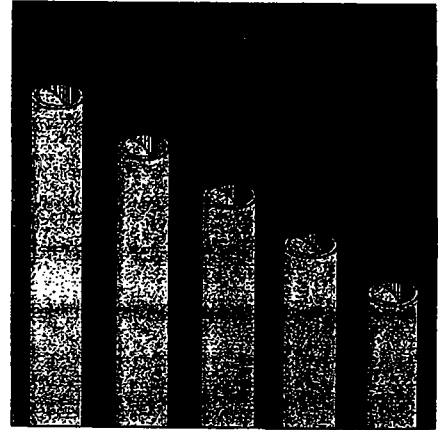


FIG. B) WATER-COOLED TUBE AND TILE

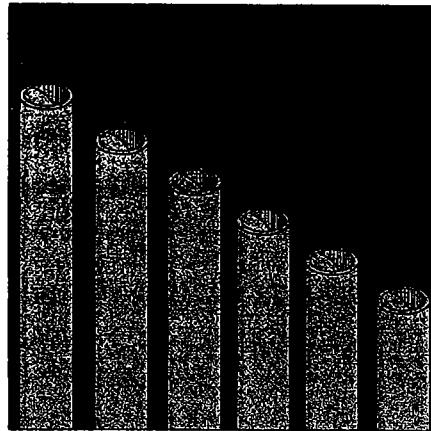


FIG. C) WATER-COOLED AND WELDED WALLS

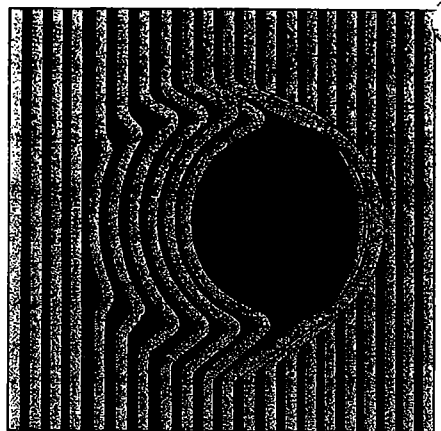
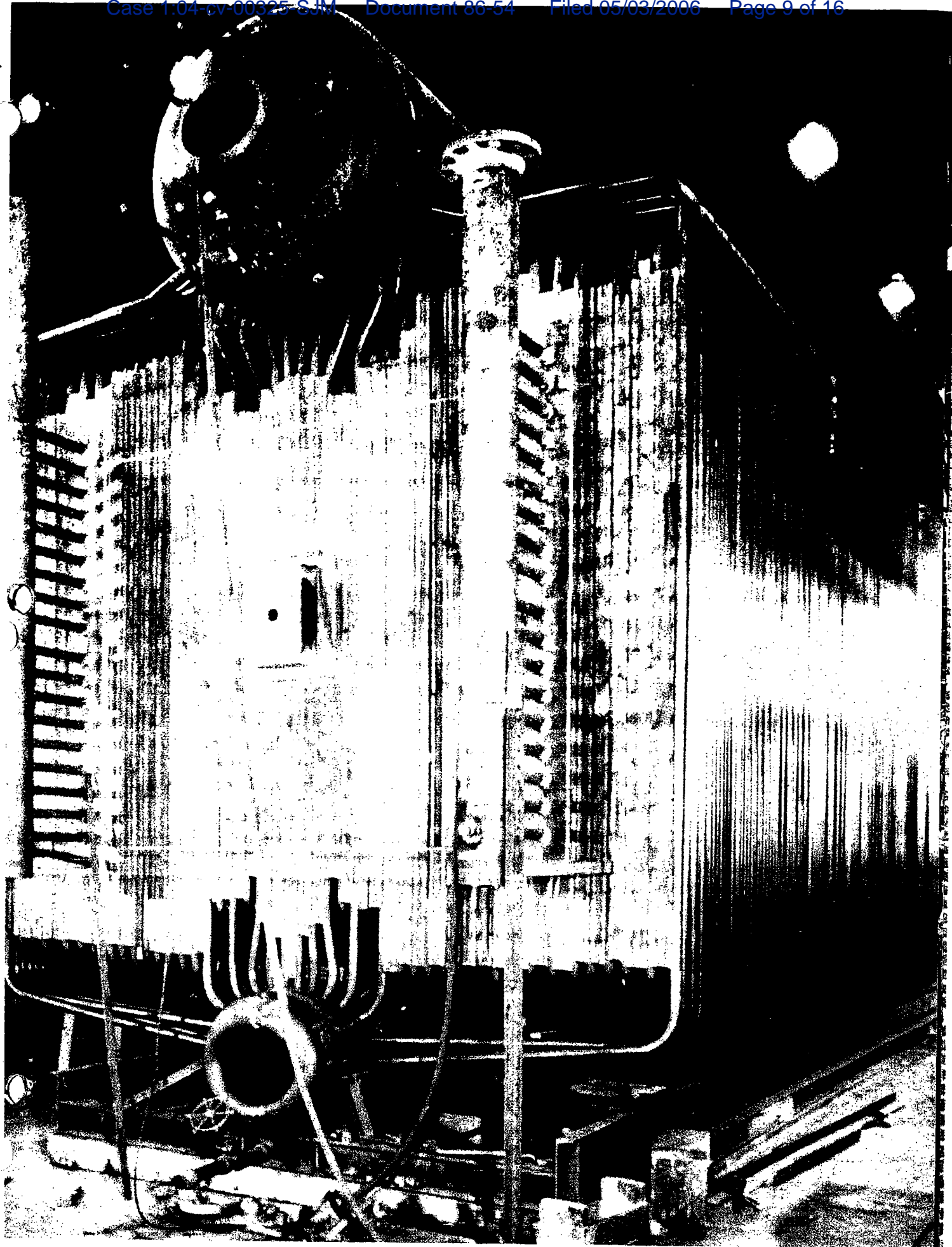


FIG. D) WATER-COOLED BURNER THROAT

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A Victory Energy KEYSTONE being constructed with a water-cooled and welded rear wall. This construction offers the ultimate in shop assembled steam generator design, increasing reliability and decreasing maintenance costs.



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KEYSTONE DESIGNED AND MANUFACTURED FOR DEPENDABLE SERVICE

Once a KEYSTONE is properly designed and detailed, each component is manufactured under a strict quality control program. Modern, specially-designed tools and equipment in the hands of qualified, experienced craftsmen produce a high quality product. Extensive work has been done in developing our Quality Assurance Manual which details step-by-step quality control at all levels – material procurement, in-process checks at all stages, and final inspection. Mandatory check lists covering all operations check and double-check each operation. In addition to mandatory ASME, American Boiler Manufacturers Association and other code tests for pressure vessels, each unit receives air pressure tests on the inner casing and a complete electrical check-out.

Initial comprehensive and detailed engineering design assures an integrated package from varying components. Preliminary analysis is conducted, utilizing computer technology to properly select and calculate design performance, and specify each component so that every requirement is presented with an integrated system at the best possible economy. All input data is carefully analyzed and designs are altered if necessary.



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Uniform construction is assured with a step-by-step quality control program.

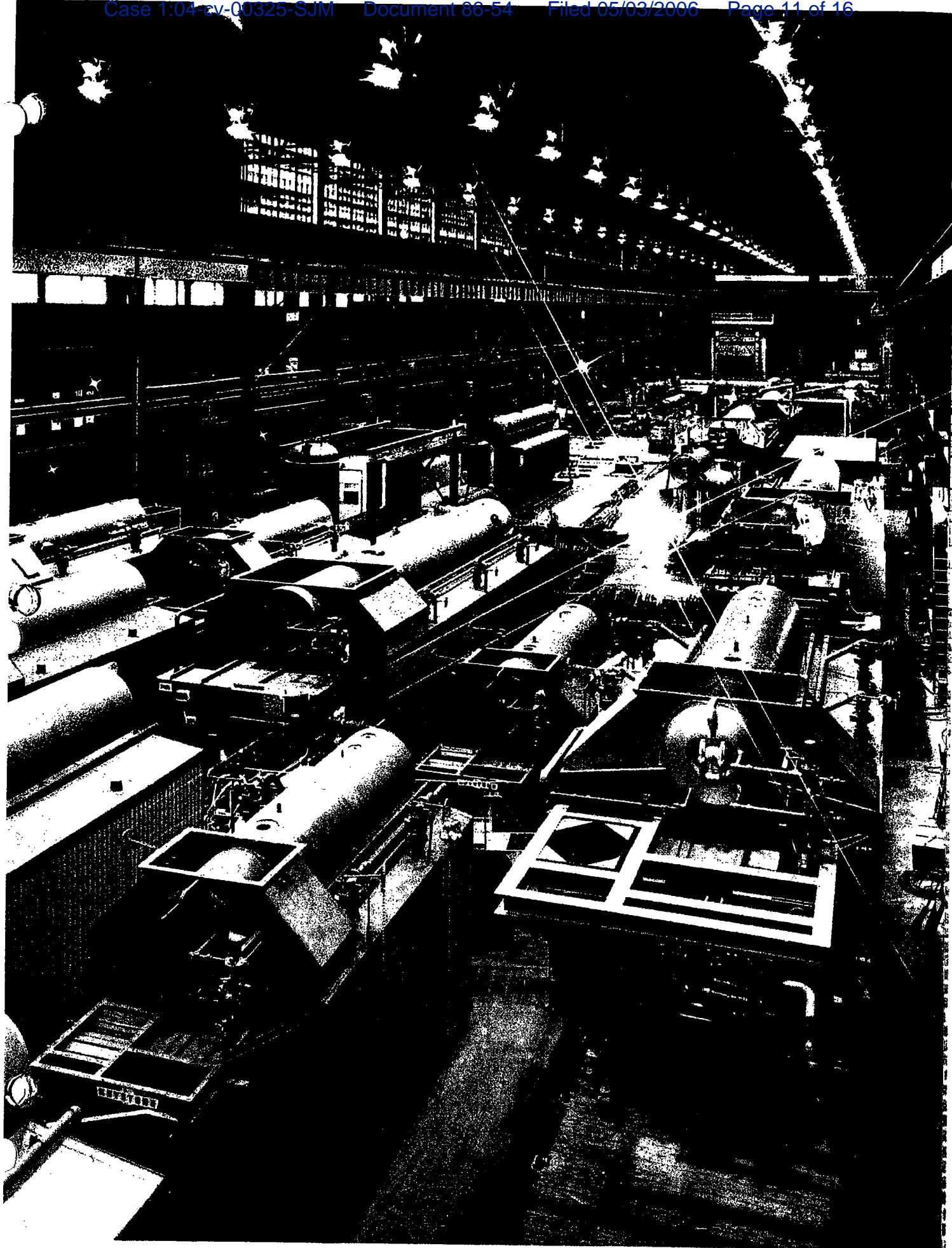
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Detailed engineering design is an important preliminary element for assuring an integrated package from varying components. A Project Manager is assigned to each contract to not only review initial engineering specifications but also to coordinate the many phases of total job responsibility.

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Overall view of fabrication and assembly area for KEYSTONE Steam Generators.





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KEYSTONE DELIVERED AS A PACKAGE

The symmetrical design and balance of every KEYSTONE insures easy handling and installation. The KEYSTONE can be skidded, jacked, or rigged without the use of special counterweights or slings. An ordinary concrete slab is all that is required to support the base. After the necessary fuel, water, and electrical connections are made, the KEYSTONE is ready to operate.

The overall physical dimensions of large factory-assembled KEYSTONE steam generators are determined by transportation clearances. Factory-assembled units can be shipped via standard rail car, low-boy truck, ship or barge, or our own specially-designed depressed-bed railroad flat car. Direct access to the Port of Catoosa opens up shipping channels over a vast area.

When it becomes necessary to field-erect a unit, every effort is made to transport pre-fabricated sections that can be "packaged" on-site to minimize field expense.

top right

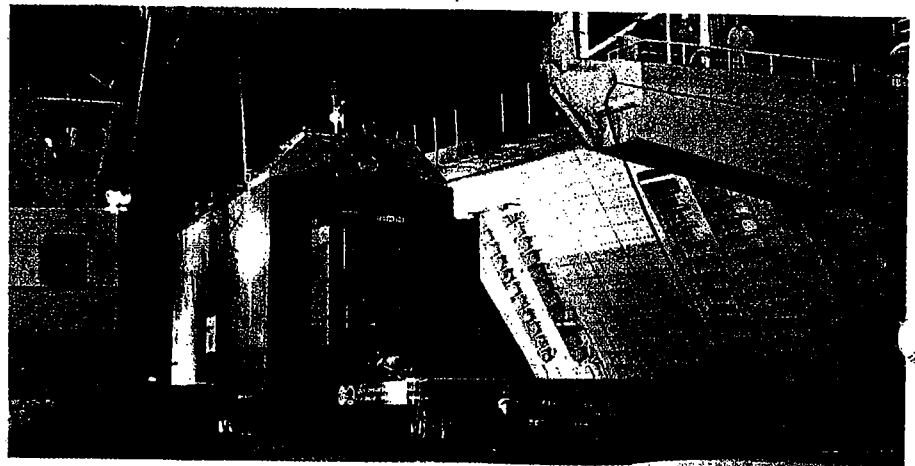
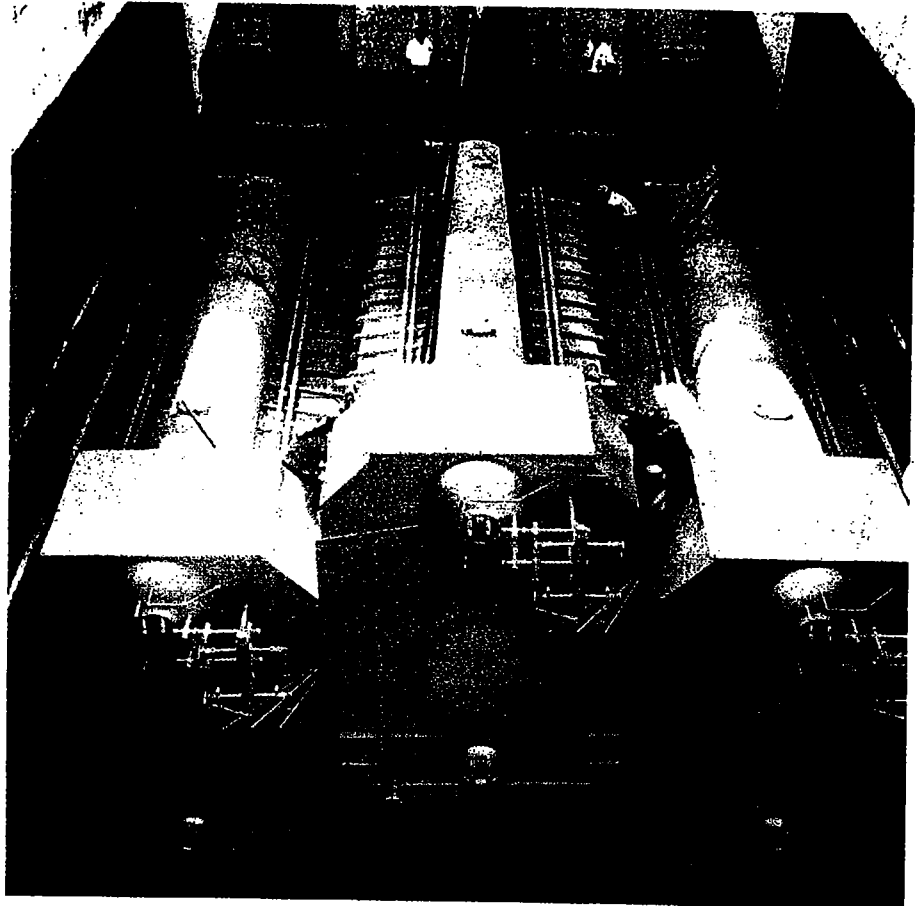
The compact design of the KEYSTONE not only aids in installation, but also in shipping, as demonstrated by this KEYSTONE being tightly "nestled" into the hull of a ship, ocean-bound via the Port of Catoosa.

bottom right

Sometimes it is advantageous to ship via long stretches of unobstructed waterways easily accessible through the Port of Catoosa.

right hand page

KEYSTONES are often the first system to be installed while new buildings are being constructed. Note the symmetrical balance of this 200,000 pounds-of-steam-per-hour steam generator being hoisted into final position.





KEYSTONE IN WORLD-WIDE SERVICE

Victory Energy employs a large, experienced service organization which can help you in all your field service requirements. Skilled service engineers can supervise installation, start-up the unit and adjust it for optimum performance. They will instruct your operators on proper operation and maintenance of the unit for a long, trouble-free life. If, due to an emergency, you should ever need service at a moment's notice, necessary manpower and equipment can be rushed to your site to make certain the unit will be back on line with a minimum of downtime.

right

A typical interior installation of a "packaged" KEYSTONE provides useful steam energy for heating and process systems at a major distillery. This 70,000 pounds-of-steam per-hour KEYSTONE, rated at 200 PSIG, burns natural gas and No. 2 fuel oil and is equipped with a fin tube economizer.

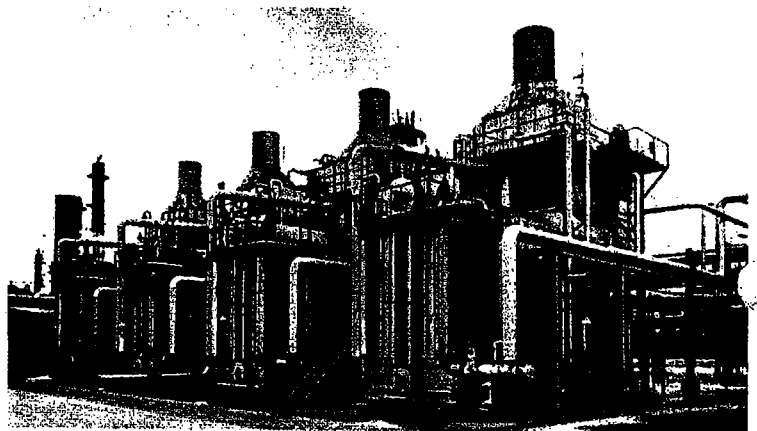
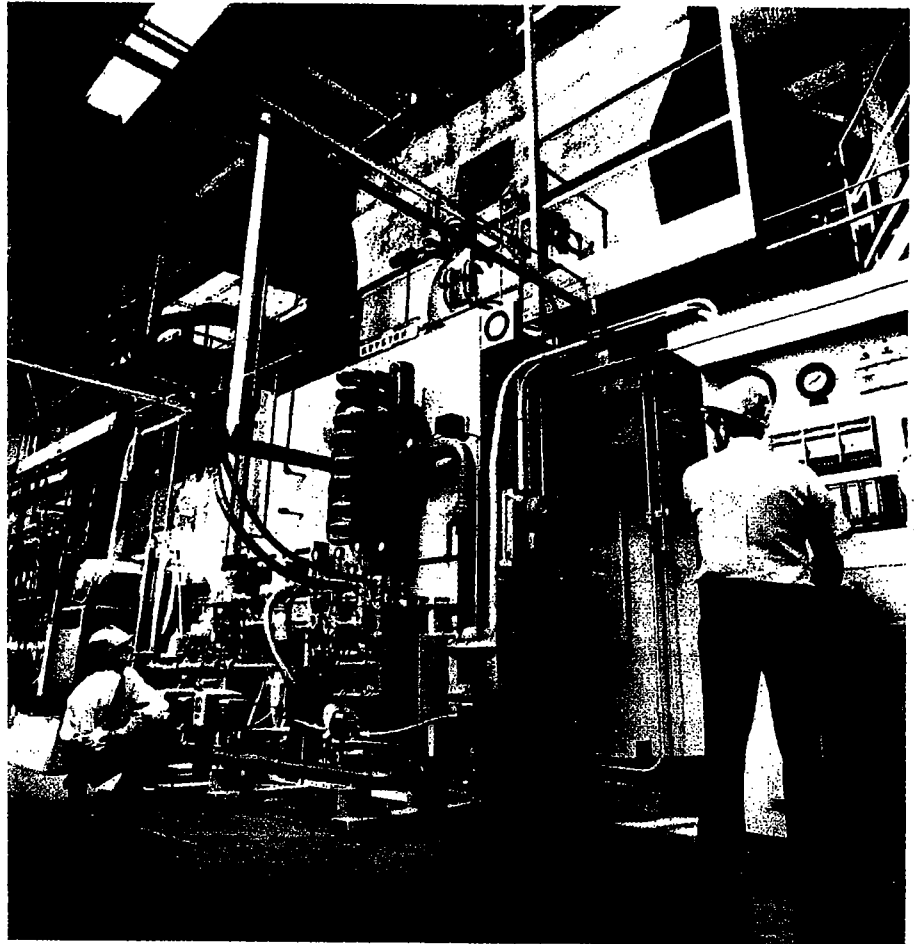
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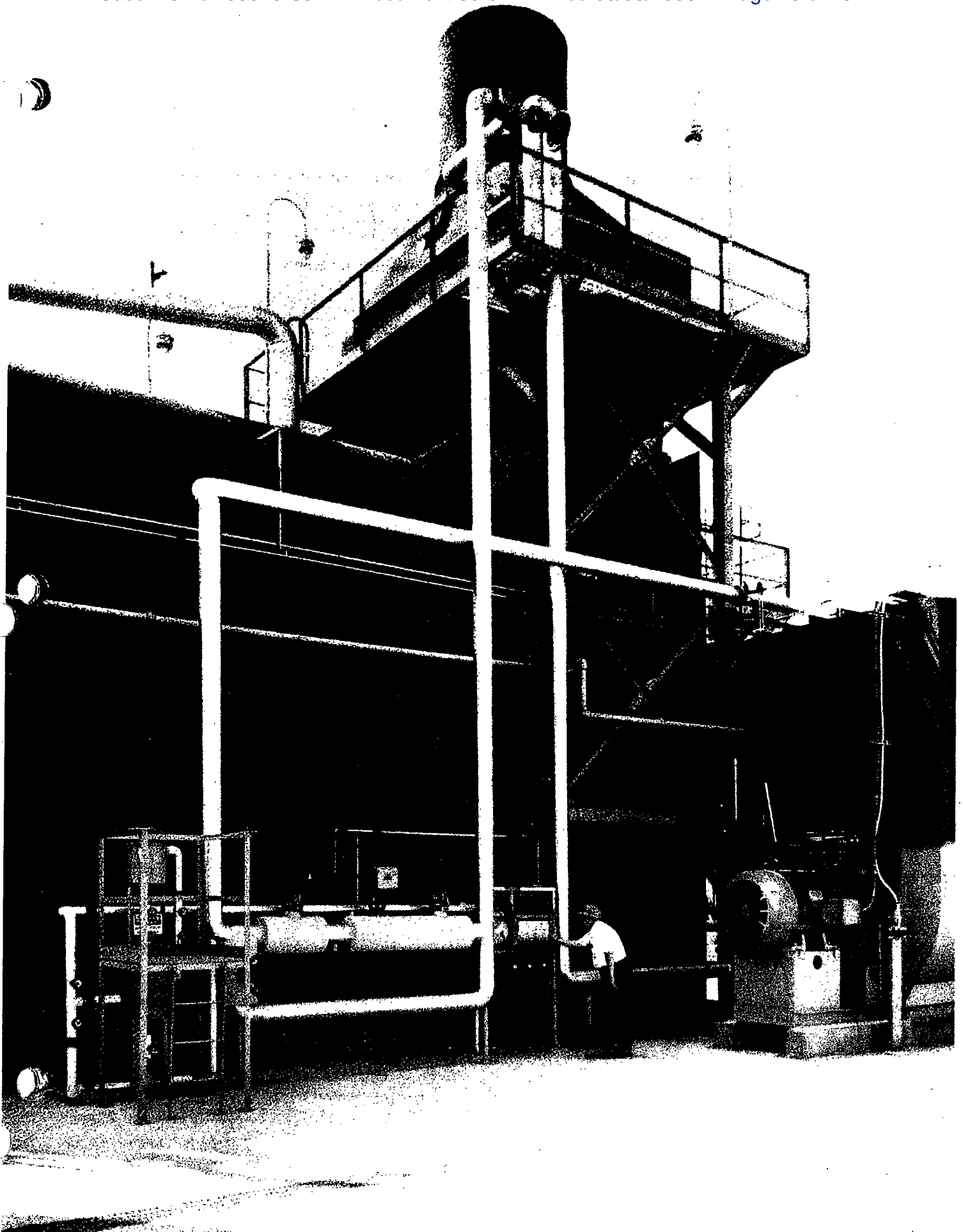
A battery of four field-erected KEYSTONES, installed over a period of several years to meet increasing demands of phased expansion of a petrochemical complex, provides 1,000,000 pounds-of-steam per-hour (250,000 each) at 650 PSIG.

Such KEYSTONES are field-erected when overall physical dimensions are greater than transportation allowances. Pre-fabricated sections are shipped so that the unit can be "packaged" on-site with a minimum of field-erection time. Economical to install, operate, and maintain, the field-erected KEYSTONE can provide up to 500,000 pounds-of-steam per-hour.

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A field-erected KEYSTONE in a chemical plant, provides 250,000 pounds-of-steam per-hour at 300 PSIG and is equipped with a superheater and a fin tube economizer.





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KEYSTONE COMPREHENSIVE PRODUCT SALES AND SUPPORT

Victory Energy maintains a comprehensive network of conveniently-located sales representative and service facilities in major U.S. cities to completely surround you with marketing expertise. Whatever your steam generating requirements – from specification to start-up and beyond – an experienced sales or service engineer is only minutes away to serve your every need. They're experienced in a wide range of industrial, power, utility and process applications and they know the KEYSTONE inside and out. Every effort is made to provide the right integrated package for each specific application. To assure the ultimate in customer satisfaction, *Victory Energy* enables them to offer a wide selection of specification choices – fuel burning systems, economizers, air heaters, super-heaters, heat recovery systems, steam purifying systems, flame safety control systems and pollution control systems – each designed and engineered to assure maximum efficiency, economy and reliability of the overall system.

Sales and Service Offices

Atlanta, Georgia
Boston, Massachusetts
Chicago, Illinois
Cincinnati, Ohio
Cleveland, Ohio
Dallas, Texas
Denver, Colorado
Detroit, Michigan
Houston, Texas
Kansas City, Missouri
Little Rock, Arkansas
Los Angeles, California
Lubbock, Texas
Memphis, Tennessee
Minneapolis, Minnesota
New Orleans, Louisiana
New York, New York
Philadelphia, Pennsylvania
Pittsburgh, Pennsylvania
Portland, Oregon
Raleigh, North Carolina
St. Louis, Missouri
Salt Lake City, Utah
San Francisco, California
Shreveport, Louisiana
Tampa, Florida
Tulsa, Oklahoma
Canada (all provinces)
Mexico



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